

We Claim:

1. A remote printing system, comprising:
a network port;
a printing device connected to said network port, wherein said printing
5 device receives first image information from said network port and generates a
printed image and a corresponding control image;
a measuring device connected to said network port, wherein said
measuring device generates second image information from said control image;
wherein said second image information is used to calibrate said
10 printing device.
2. The remote printing system of Claim 1 further comprising an image
server located remotely from said printing device and said measuring device, said
image server adapted for communication with said printing device and said
measuring device over a communication medium.
- 15 3. The remote printing system of Claim 2 wherein said image server
transmits said first image data to said printing device; and said measuring device
transmits said second image information to said image server.
4. The remote printing system of Claim 3 wherein said image server
generates print quality information from said second image information.
- 20 5. The remote printing system of Claim 1 further comprising a computer
collocated with, and connected to said printing device, said measuring device, and
said communication port, wherein said computer relays said first image data to
said printing device; and said measuring device transmits said second image
information to said computer.
- 25 6. The remote printing system of Claim 5 wherein said computer
generates print quality information from said second image information.
7. The remote printing system of Claim 1 wherein said control image is
printed adjacent to said printed image.
8. The remote printing system of Claim 1 wherein said control image
30 comprises an arrangement of predetermined colors.
9. The remote printing system of Claim 8 wherein said arrangement of
predetermined colors provides identification information.
10. A remote printing system comprising:
a computer including a memory, a processor, and a network port,
35 wherein said computer receives first image information via said network port;
a printing device connected to said computer for generating a printed
image from said first image information; and,

a measuring device connected to said computer for generating second image information from said printed image;
wherein said computer generates a quality measurement in response to said second image information.

5 11. The remote printing system of Claim 10 wherein said network port is a packet switched network port.

12. The remote printing system of Claim 10 wherein said network port includes a protocol stack.

13. The remote printing system of Claim 12 wherein said protocol stack is a TCP/IP stack.

14. The remote printing system of Claim 10 wherein said network port is a circuit switched communication port.

15. The remote printing system of Claim 10 wherein said measuring device is a spectrophotometer.

15 16. The remote printing system of Claim 10 wherein said measuring device is a colorimeter.

17. The remote printing system of Claim 10 wherein said quality measurement is used to generate a quality verification signal.

18. The remote printing system of Claim 10 wherein said quality measurement is indicative of a variation between said second image information and predetermined reference information.

19. A remote printing system comprising:
a computer including a memory, a processor, and a network port;
a printing device connected to said network port for generating a printed
25 image from digital image source information received over said network port; and,
a measuring device connected to said communication port for generating digital image measurement information from a printed image;
wherein said computer is configured to perform the steps of:

30 receiving digital image source information over said network port;
transmitting instructions to said printing device to generate a printed image corresponding to the received digital image source information;
receiving digital image measurement information from said measuring device derived from the printed image; and,
verifying print quality by comparing the image measurement
35 information to a digital reference.

20. The apparatus of Claim 19 further comprising a data structure stored in said memory, said data structure containing fields for said digital reference and said image measurement information.

21. The apparatus of Claim 19, wherein said measuring device is a spectrophotometer.

22. The apparatus of Claim 19, wherein said measuring device is a colorimeter.

5 23. The apparatus of Claim 19, wherein said measuring device is a densimeter.

24. A method of ensuring print quality at a remote location comprising the steps of:

10 receiving digital image information from a communication medium;
printing an image corresponding to the received digital picture information;

printing corresponding control information;
generating digital control information from the printed control information; and,

15 verifying print quality by comparing the digital control information to a digital reference.

25. The method of Claim 24 wherein the step of printing control information includes the step of generating a sequence of colors selected from a set of predetermined colors in response to a print job identification number.

20 26. The method of Claim 25 wherein each predetermined color is predetermined with respect to a platform-independent color space.

27. The method of Claim 26 wherein each predetermined color is transferred to the color space of the printing device prior to printing.

28. The method of Claim 25 wherein each predetermined color is predetermined with respect to the color space of the printing device.

25 29. The method of Claim 24 further comprising the step of generating identification information from the digital control information.

30 30. The method of Claim 29 where the digital reference is a set of predetermined colors, and wherein the step of generating identification information includes the step of determining a sequence of colors from the digital control information with reference to the set of predetermined colors.

31. The method of Claim 24 wherein the step of verifying print quality comprises the step of generating an error measurement from the digital control information and the digital reference.

35 32. The method of Claim 31 wherein the step of verifying print quality further comprises determining whether the error measurement exceeds a threshold.

33. The method of Claim 24 comprising the step of updating the printer characteristic function in response to the digital control information.

34. A remote printing system, comprising:
a network port;

5 a printing device connected to said network port, wherein said printing device receives first image information from said network port and generates a printed image and a corresponding control image;

a measuring device connected to said network port, wherein said measuring device generates second image information from said control image;

10 wherein said corresponding control image is used to identify the printed image.

35. The system of Claim 34 wherein the control information includes a sequence of colors selected from a set of predetermined colors in response to a print job identification number.

15 36. The system of Claim 34 further comprising an image server located remotely from said printing device and said measuring device, said image server provided said first image information.

20 37. The remote printing system of Claim 36 wherein said image server transmits said first image data to said printing device; and said measuring device transmits said second image information to said image server.

38. The remote printing system of Claim 37 wherein said image server generates print quality information from said second image information.

25 39. A system for remote printing comprising an image server computer adapted for connection to a remote printing station, said server computer having a memory, a processor, and a network port, wherein said image server computer is configured to perform the steps of:

transmitting digital image source information over said network port for printing an image at the remote printing station;

30 receiving digital image measurement information from the remote printing station; and,

verifying print quality by comparing the measurement image information to a digital reference.

40. The system of Claim 39 wherein the digital image source information includes identification information.

35 41. The system of Claim 40 wherein the identification information is a sequence of colors selected from a set of predetermined colors in response to a print job identification number.

42. The method of Claim 41 wherein each predetermined color is predetermined with respect to a platform-independent color space.

43. The method of Claim 41 wherein each predetermined color is transferred to the color space of the printing device prior to printing.

5 44. The method of Claim 41 wherein each predetermined color is predetermined with respect to the color space of the printing device.

45. A system for remote printing comprising an image server computer adapted for connection to a remote printing station, said server computer having a memory, a processor, and a network port, wherein said image server computer is
10 configured to perform the steps of:

transmitting print job instructions including digital image source information over said network port for printing an image at the remote printing station, said digital image source information including an associated control image that incorporates identification information;

15 receiving digital image measurement information from the remote printing station corresponding to measurements of the printed control image; and,

identifying a print job associated with said digital image source information from said received digital image measurement information.

46. The system of Claim 45 wherein the digital measurement information
20 is used to generate calibration instructions to be sent to the remote printing station.

47. The system of Claim 45 wherein the identification information is a sequence of colors selected from a set of predetermined colors.

48. The method of Claim 41 wherein each predetermined color is predetermined with respect to a platform-independent color space.

25 49. The method of Claim 41 wherein each predetermined color is transferred to the color space of the printing device prior to printing.

50. The method of Claim 45 wherein each predetermined color is predetermined with respect to the color space of the printing device.

51. A system for remote printing comprising an image server computer adapted for connection to a remote printing station, said server computer having a memory, a processor, and a network port, wherein said image server computer is
30 configured to perform the steps of:

transmitting print job instructions including digital image source information over said network port for printing an image at the remote printing
35 station, said digital image source information including an associated control image; and,

receiving verification information from the remote printing station corresponding to measurements of the printed control image.

52. The system of Claim 51 wherein the verification information is digital measurement information, and further comprising the step of comparing said digital measurement information to a digital reference.

53. The system of Claim 52 further comprising the steps of:
5 generating printer calibration update information from said digital measurement information; and,
transmitting said calibration update information to the remote printing station.

54. The method of Claim 51 wherein the verification information is a
10 verification message indicating acceptable image quality.

55. A system for remote printing comprising an image server computer adapted for connection to a remote printing station, said server computer having a memory, a processor, and a network port, wherein said image server computer is configured to perform the steps of:
15 transmitting print job instructions including digital image source information over said network port for printing an image at the remote printing station, said digital image source information including an associated control image;

receiving measurement information from the remote printing station
20 corresponding to measurements of the printed control image;
generating printer calibration update information from said digital measurement information; and,
transmitting said calibration update information to the remote printing station.

56. The system of Claim 55 wherein the control information is a sequence
25 of colors selected from a set of predetermined colors.

57. The system of Claim 56 wherein each predetermined color is predetermined with respect to a platform-independent color space.

58. The system of Claim 56 wherein each predetermined color is
30 transferred to the color space of the printing device prior to printing.

59. The system of Claim 56 wherein each predetermined color is predetermined with respect to the color space of the remote printing device.

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